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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,232	08/24/2001	William Joseph Armstrong	IBM / 182	4082

7590   10/22/2004

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EXAMINER
PROCTOR, JASON SCOTT

ART UNIT	PAPER NUMBER
2123	7

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.		**Applicant(s)**
Office Action Summary	09/939,232		ARMSTRONG ET AL.
	Examiner		**Art Unit**
	Jason Proctor		2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>24 August 2001</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____ .

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/15/2001</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail. Date _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

Additional Information Disclosure Statements:
Paper No(s)/Mail Date 7/15/2002
Paper No(s)/Mail Date 10/20/2003
Paper No(s)/Mail Date 1/16/2004
Paper No(s)/Mail Date 8/23/2004

DETAILED ACTION

1.   Claims 1-20 have been rejected.

Drawings

2.   The drawings are objected to because references 42 and 44 (Fig. 2) are depicted as "Primary Partition (B)" and "Primary Partition (C)", respectively, but disclosed as "secondary partitions" (page 8, lines 14-16).   Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4.   Claims 6 and 15 recite the limitation "a presented count conveyed in the yield command" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Examiner presumes "a presented count conveyed in the yield request" for the remainder of this action.

5.   Claims 8 and 17 recite the limitation "the target processor" in line 2. There is insufficient antecedent basis for this limitation in the claim. Examiner presumes "the target virtual processor" for the remainder of this action.

6.   Claims 9 and 18 recite the limitation "a yielding processor" in line 2. There is insufficient antecedent basis for this limitation in the claim. Examiner presumes "a yielding virtual processor" for the remainder of this action.

7.   Appropriate correction is required.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102

that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   Claims 1-6 and 10-15 are rejected under 35 U.S.C. § 102(b) as being anticipated

by Bitar et al., US Patent No. 5,872,963.

10.   Regarding claim 1, Bitar et al. teaches a system and method for context

switching between a first and a second execution entity (abstract) wherein

> the system supports a plurality of partitions (column 6, line 9-11; Fig 10),
>
> the partitions include a plurality of virtual processors that share at least
>
> one CPU (column 8, line 21-54; column 15, lines 34-45),
>
> requesting with a yielding virtual processor a yield of the CPU upon which
>
> the virtual processor is executing including designating a target
>
> virtual processor from among the plurality of virtual processors
>
> (column 10, line 48 – column 11, line 10), and
>
> switching-in the target virtual processor for execution by the CPU in
>
> response to the requested yield (column 10, lines 20-33; column
>
> 11, lines 33-41).

Although Bitar et al. teaches the invention in terms of threads, the same method can be used to switch between other types of execution entities (column 13, lines 49-52).

11.   Regarding claim 2, Bitar et al. teaches a method of context switching wherein the target virtual processor requires access to the CPU, wherein the yielding virtual processor controls the CPU (column 10, line 48 – column 11, line 10; column 11, lines 33-41).

12.   Regarding claim 3, Bitar et al. teaches a method of context switching comprising generating a yield command from the virtual processor, wherein the yield command includes pointer and status information regarding the target virtual processor (column 10, lines 9-33).

13.   Regarding claim 4, Bitar et al. teaches a method of context switching comprising assigning status information to the target virtual processor (column 10, lines 9-33).

14.   Regarding claim 5, Bitar et al. teaches a method of context switching comprising assigning a target count to the target virtual processor (column 10, lines 9-33). The preempt bit vector holds a value of 0 for a thread that has its resource requirements fulfilled and holds a value of 1 for a thread that has been preempted and requires resources to continue.

15.   Regarding claim 6, Bitar et al. teaches a method of context switching comprising comparing the target count to a presented count conveyed in the yield request (column 10, lines 9-33; column 13, line 53 – column 14, line 24; column 16, lines 29-44).

16.   Regarding claim 7, Bitar et al. teaches a method of context switching comprising aborting the yield in response to a yield-to-active command. If the processor is not needed, it will be reallocated to another process (column 16, lines 29-44).

17.   Regarding claim 8, Bitar et al. teaches a method of context switching comprising designating the yielding virtual processor as waiting for the target virtual processor (column 10, line 48 – column 11, line 10; column 11, lines 33-41; column 16, lines 29-44).

18.   Regarding claim 9, Bitar et al. teaches a method of context switching comprising designating the target virtual processor as having a yielding processor waiting for the target virtual processor (column 13, line 53 – column 14, line 24; column 16, lines 29-44).

19.   Regarding claim 10, Bitar et al. teaches a method of context switching comprising storing the state of the yielding virtual processor (column 10, lines 9-33; column 13, lines 53-60).

20.   Claims 11-18 are directed toward an apparatus comprising a computer system and a computer program to execute the method of claims 1-3, and 5-9. As the invention of Bitar et al. is a computer system and program (abstract), claims 11-18 are rejected for reasons similar to those given for claims 1-3, and 5-9 above.

21.   Claims 19 and 20 are directed toward a program product and signal bearing medium bearing a computer program which executes the method of claim 1. As the invention of Bitar et al. can be realized with a computer program, whether transmitted via a network or stored locally (abstract; column 17, lines 20-27; column 20, line 49 –

column 21, line 10), claims 19 and 20 are rejected for reasons similar to those given for claim 1 above.

Conclusion

Art considered pertinent by the examiner but not applied has been cited on form PTO-892. "The Enhancement of a User-level Thread Package Scheduling on Multiprocessors" by Gil, Martorell, and Navarro teaches yielding virtual processors in producer-consumer thread relationships.

Additionally, "Scheduling Support for Concurrency and Parallelism in the Mach Operating System" by David L. Black teaches discouragement and synchronization hints to adjust the status of the yielding processor and target virtual processor to realize better utilization of the physical processor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (703) 305-0542 or (571) 272-3713 beginning in October 2004. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin J Teska can be reached on (703) 305-9704 or (571) 272-3716 beginning in October 2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Proctor
Examiner
Art Unit 2123

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